

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Amendment of the Commission's Rules with)	GN Docket No. 12-354
Regard to Commercial Operations in the 3550-)	
3650 MHz Band)	

To: The Commission

**COMMENTS OF
THE WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION**

**WIRELESS INTERNET SERVICE
PROVIDERS ASSOCIATION**

February 20, 2013

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SUMMARY

The Wireless Internet Service Providers Association (“WISPA”) supports the establishment of the Citizens Broadband Service and the allocation of 100 megahertz of spectrum in the 3.5 GHz Band for fixed wireless broadband and other services. In its Comments, WISPA offers recommendations on how the Commission’s proposals can be improved to promote efficient spectrum sharing with federal and commercial incumbent users, maximize opportunities for wireless Internet service providers (“WISPs”) and enable new small cell “critical uses,” subject to the implementation of a three-tiered Spectrum Access System (“SAS”) that will protect incumbents from interference and coordinate “license by rule” commercial use. WISPA also urges the Commission to combine the regulatory structure of the 3.5 GHz band and the existing 3650-3700 MHz band into a unitary service with common technical and operating rules, and proposes a five-year transitional period for the 3650-3700 MHz Service.

WISPA’s spectrum use proposals stem from the July 2012 report produced by the President’s Council of Advisors on Science and Technology (“PCAST Report”). The *Incumbent Access* tier would be reserved for federal radar systems and grandfathered earth stations. Federal radar systems would be protected through a commercial SAS interfacing with a federal database to ensure real-time protection, not with exclusion zones that would create permanent areas where commercial opportunistic use would be prohibited. Earth stations would be protected in geographic zones, as is the case with earth stations in the 3650-3700 MHz band. The *Priority Access* tier would allow “small cell” operation for “critical use” in the lower 50 megahertz of the 3.5 GHz band (*i.e.*, from 3550-3600 MHz). WISPA also recommends adoption of the Commission’s proposal to establish Higher Power Operation Zones in rural areas, and proposes that higher power use in the 3600-3650 MHz and the 3650-3700 MHz bands be subject to Priority Access. Also, existing commercial users in the 3650-3700 MHz band would be

grandfathered as Priority Access to prevent interference from subsequent opportunistic uses. The *General Authorized Access* tier would include all other opportunistic uses and would be required to protect Incumbent Access and Priority Access users.

WISPA proposes to include the existing 3650-3700 MHz Service into the Citizens Broadband Service, with a five-year transitional period. During this period, records in the existing Universal Licensing System database would be transferred to the commercial SAS.

The Commission also should consider whether the implementation of an SAS database would simplify and streamline operation in the existing 3650-3700 MHz band while providing interference protection for federal users and grandfathered earth stations.

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The Wireless Internet Service Providers Association ("WISPA"), pursuant to Sections 1.415 and 1.419 of the Commission's Rules, hereby comments in response to the Notice of Proposed Rulemaking and Order ("*NPRM*") adopted in the above-captioned proceeding.¹

WISPA strongly endorses commercial use of the 3550-3650 MHz band on a shared basis under a three-tiered approach that will enable efficient use of the band for fixed wireless broadband and other services. Building on the concepts described in the report issued by the President's Council of Advisors on Science and Technology ("PCAST"),² WISPA proposes a band plan and regulatory structure that protects federal users, provides additional spectrum for fixed wireless broadband deployment and authorizes small cells for "mission critical" and other "opportunistic uses" under a database-managed "license by rule" scheme. WISPA further recommends procedures for the transition of the adjacent 3650-3700 MHz band so that, over a reasonable time

¹ *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Notice of Proposed Rulemaking and Order, GN Docket No. 12-354 (rel. Dec. 12, 2012). See also *Commercial Operations in the 3550-3650 MHz Band*, 78 Fed. Reg. 1188, 1188 (Jan. 8, 2013) (establishing February 20, 2013 as the deadline for filing Comments). Accordingly, these Comments are timely filed.

² PCAST, Report to the President: Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth (July 20, 2012) ("PCAST Report"), *available at* http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf.

period, the entire 150 megahertz band will be managed under a single set of rules by a geolocation database.

Introduction

WISPA is the trade association that represents the interests of wireless Internet service providers (“WISPs”) that provide fixed wireless broadband services to consumers, businesses and first responders across the country. WISPA’s members include more than 700 WISPs, equipment manufacturers, distributors and others. WISPA estimates that WISPs serve more than 3,000,000 people, many of whom reside in rural, unserved and underserved areas where wired technologies like DSL and cable Internet access services may not be available. In some of these areas, WISPs offer the only terrestrial source for fixed broadband access. In areas where other broadband options are available, WISPs provide a local access alternative that fosters competition in service, cost and features.

WISPs rely principally on unlicensed spectrum in the 900 MHz, 2.4 GHz and 5 GHz bands, along with “lightly licensed” spectrum in the 3650-3700 MHz band, to deliver fixed broadband services. These bands are shared with other WISPs, industrial users such as smart grid companies, and consumer devices such as baby monitors, garage door openers, cordless telephones and home WiFi networks. WISPs have demonstrated an ability to maximize spectrum efficiency by coordinating with other users. WISPs practice interference-reduction techniques such as the selection and use of directional antennas and the use of antenna cross-polarization. In addition, WISPs also utilize both mandatory³ and voluntary databases⁴ to

³ See *Unlicensed Operation in the TV Broadcast Bands*, Order, 26 FCC Rcd 554 (2011) (“*White Space Database Order*”).

prevent interfering with incumbent licensees. Compared to licensed spectrum, the primary benefit of unlicensed and “lightly licensed” spectrum is that the barriers to market entry are substantially lower. Infrastructure can be built and service deployments can occur years in advance of the time that similar services could be deployed using auctioned and licensed spectrum. Because unlicensed spectrum is non-exclusive, it is not required to be assigned by competitive bidding under Section 309(j) of the Communications Act of 1934, as amended (the “Act”). WISPs therefore do not have to wait until the Commission conducts an auction to initiate service, nor do they have to compete with multi-billion dollar carriers for spectrum rights for large-area exclusive spectrum. Although they do not obtain “exclusivity by rule,” WISPs have been able to quickly deploy and expand services because of the availability of innovative, reasonably-priced license-free equipment. The ability by WISPs to serve over 3,000,000 people in 15 years using shared unlicensed spectrum is one of the Commission’s true success stories.

WISPA is pleased that the Commission has initiated this proceeding to adopt rules for an additional 100 megahertz of spectrum that WISPs and others can use to deliver wireless services. Access to this additional spectrum, even on a shared basis, will help relieve the congestion and capacity constraints in other bands that restrict the ability of WISPs to extend service to new areas and increase capacity to meet the expanding broadband demand in existing areas. As the Commission acknowledged in the *NPRM*:

[W]ireless internet service providers see significant value in the use of 3.5 GHz for fixed wireless broadband. Indeed, the Wireless Internet Service Providers Association (WISPA) has

⁴ See, e.g., Memorandum from Julius Knapp, Chief, Office of Engineering and Technology, and P. Michele Ellison, Chief, Enforcement Bureau, to Manufacturers and Operators of Unlicensed 5 GHz Outdoor Network Equipment (July 27, 2010), available at http://www.spectrumbridge.com/Libraries/Misc_docs/FCC_Memorandum_on_UNII_Device_Operation.sflb.ashx (acknowledging availability of WISPA database for voluntary registration of Part 15 operations in 5 GHz bands that are shared with Terminal Doppler Weather Radio facilities).

urged the Commission to adopt licensing and operational rules consistent with the rules adopted for fixed broadband use in 3650-3700 MHz. By doing so, they argue, the Commission would create a contiguous 150 megahertz band for fixed wireless broadband use.⁵

WISPA believes that there are three very significant steps the Commission can take to successfully achieve the goal of making “up to 150 megahertz of contiguous spectrum available for innovative mobile and fixed broadband services without displacing mission-critical incumbent systems.”⁶ First, the Commission should adopt the three-tiered PCAST approach as a baseline for structuring use of the band. Specifically, WISPA recommends permitting “small cell” Priority Access in the lower 3550-3600 MHz portion of the band, higher power Priority Access use in the 3600-3700 MHz portion of the band, and General Authorized Access (“GAA”) use across the entire 3550-3700 MHz band. Second, the Commission should adopt a Spectrum Access System (“SAS”) that relies on commercial geolocation databases and, where necessary, geographic protection zones to protect federal and incumbent users. Third, the Commission should, over a five-year period, transition the current 3650-3700 MHz manual Universal Licensing System (“ULS”) registration process to the SAS to reduce burdens on existing users. Taken together, the rule changes proposed herein will spark innovation, stimulate expansion of broadband access and reduce administrative and regulatory burdens, paving the way for rapid and spectrally efficient deployment on an additional 100 megahertz of responsibly shared spectrum.

⁵ *NPRM* ¶ 47 (footnotes omitted); *see also* Comments of WISPA, ET Docket No. 10-123 (Apr. 22, 2011) (“WISPA Task Force Comments”).

⁶ *Id.* ¶ 1.

Discussion

I. THE COMMISSION SHOULD BUILD ON THE THREE-TIERED PCAST SPECTRUM ACCESS STRUCTURE, WITH ENHANCEMENTS TO ENCOURAGE SPECTRALLY EFFICIENT USE OF THE 3550-3700 MHz BAND.

The Commission has a golden opportunity to create a comprehensive band plan based on the PCAST sharing model that makes available an additional 100 megahertz of shared spectrum, integrates the 3650-3700 MHz band into a common regulatory structure and relies on commercial databases to ensure interference protection to federal users and existing satellite earth stations. WISPA therefore supports many of the proposals described in the *NPRM* and presents several specific proposals in response to the Commission's inquiries.

Benefits of the PCAST Model

With the modifications described below to accommodate existing commercial users and stimulate use in rural areas, WISPA endorses the spectrum sharing model developed in the PCAST Report as a means to make available additional spectrum for affordable fixed broadband services. PCAST specifically identified the 3550-3650 MHz band as “a good initial candidate” for sharing among federal and commercial users.⁷ Given that the band would be used primarily for fixed uses in defined areas with incumbents entitled to protection, WISPA agrees that a three-tiered approach can be successfully implemented in a manner that is spectrally efficient and drives innovation, while protecting the rights of satellite licensees and federal users.⁸

WISPA also supports the Commission's proposal for a “license by rule” model regulated by Part 95 instead of a regulatory model governing Part 15 devices and uses.⁹ WISPA agrees that this approach would “allow for a more unified authorization framework for multiple tiers of

⁷ PCAST Report at 82.

⁸ See *NPRM* ¶ 49 (recognizing interests of satellite earth station licensees).

⁹ See *id.* ¶ 11. As discussed below, WISPA urges the inclusion of the 3650-3700 MHz band into the same service, meaning that the rules contained in Section 90.1301, *et seq.*, would be relocated to Part 95.

users that otherwise might fall into different parts of the Commission’s rules.”¹⁰ In addition, “license by rule” implies an SAS database regime in which users can make initial determinations about the location of other users and the spectrum they are using prior to registration. This will assist users, especially GAA users, in spectrum planning and equipment purchasing. “License by rule” with SAS requirements represents an evolution of *ad hoc* unlicensed systems where spectrum coordination often occurs after deployment, an inefficient and outdated approach for avoiding interference.

The Commission asks whether it should adopt a two-tiered spectrum access system, exclusive licensing or “light licensing” of the 3.5 GHz Band.¹¹ WISPA’s proposals recommend Priority Access rights for existing 3650-3700 MHz licensees and for operation in Higher Power Operation Zones, and a two-tiered approach would not be viable for this model. Further, WISPA’s proposal to allow small cell Priority Access in the lower 50 megahertz mandates a three-tiered system to accommodate opportunistic uses. By contrast, the Qualcomm two-tiered approach would not allow GAA use, and thus would be much less spectrally efficient.¹² The two-tiered approach does not account for WISP use of the band on an opportunistic basis and should therefore be rejected. An exclusive-area geographic licensing approach likely would require an auction, which would increase barriers to entry by WISPs that rely on ready and affordable access to spectrum to provide affordable fixed broadband service in areas that likely would otherwise only receive such service much later and at significantly higher prices. Finally, the SAS model relies on geolocation capabilities, which is superior to the “light licensing” approach the Commission adopted for the 3650-3700 MHz band. Although a good idea at the time, “light licensing” is subject to human error by the registrant and can take several days or

¹⁰ *Id.*

¹¹ *See id.* ¶¶ 83-86.

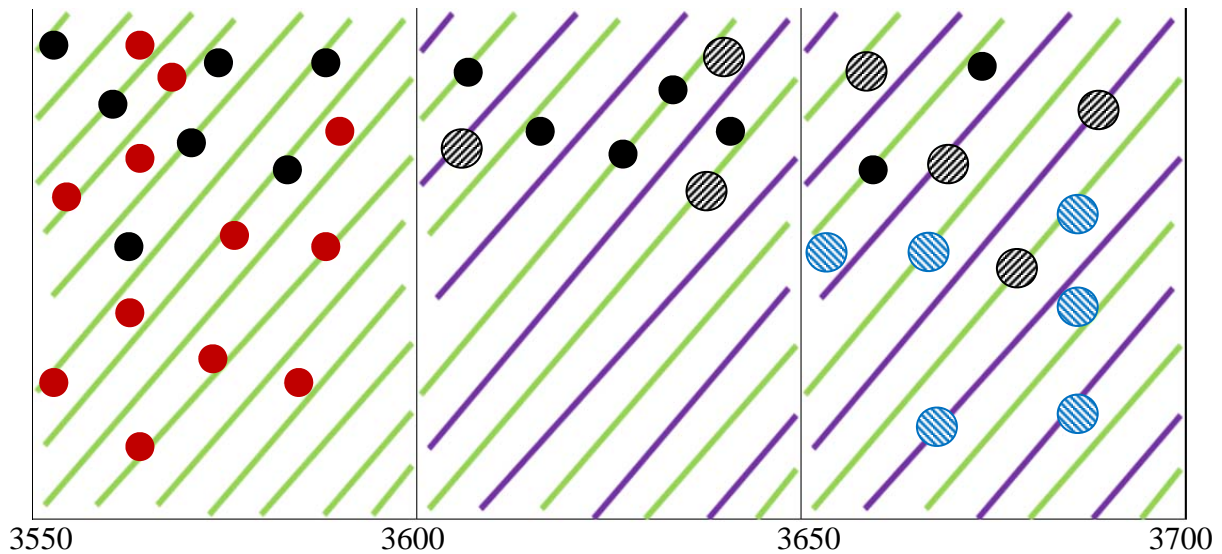
¹² *See id.* ¶ 84.

weeks for registrations to be approved. A “license by rule” approach enabled by an automated SAS is the best and most efficient option for regulating use of the band.

WISPA’s Proposal

A critical component of WISPA’s proposal is an SAS system that enables more efficient spectrum utilization by creating layers of protection based on access tiers, spectral separation and geographic protection zones, while creating greater opportunities to increase the coverage and capacity of fixed broadband service in rural areas. WISPA believes that the SAS should be modeled on the TV white space database to ensure proper and responsible spectrum sharing. WISPA’s overall proposal is described in the diagram that follows:¹³

¹³ The number and size of the circular figures are not to scale.



Legend		
Incumbent Access	●	Federal Incumbents
	⊘	Earth Stations – Exclusion Zones (3.5 GHz and 3650-3700 MHz)
Priority Access	●	Priority Access – Small Cells (indoor and short-range)
	⊘	Grandfathered 3650-3700 MHz “Lightly Licensed” Stations
	▨	High Power Operation Zones (rural areas)
General Authorized Access	▨	Opportunistic Use

Incumbent Access Tier

WISPA agrees with the Commission’s proposal to protect federal users in the 3550-3650 MHz band.¹⁴ However, in contrast to the conclusions in NTIA’s Fast Track Report,¹⁵ WISPA believes that large coastal exclusion zones are not necessary to ensure that ground-based, airborne and shipborne radar systems have interference protection. This is true for several reasons. First and foremost, radar systems are not in use all of the time at all locations, so

¹⁴ See *id.* ¶ 66. Federal users are shown as solid black circles.

¹⁵ NTIA, An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675-1710 MHz, 1755-1780 MHz, 3500-3650 MHz, 4200-4220 MHz, and 4380-4400 MHz Bands (rel. October 2010) (“Fast Track Report”), available at http://www.ntia.doc.gov/files/ntia/publications/fasttrackevaluation_11152010.pdf.

establishing large exclusion zones that entirely preclude commercial use of the 3.5 GHz Band would be extremely overprotective. This is especially true with respect to shipborne radar systems which, if the Fast Track Report's assumptions and the Commission's estimates are accurate, would preclude use of the 3.5 GHz Band by 60 percent of the population.¹⁶ Second, and as WISPA previously stated, the Fast Track Report was predicated on the assumption that the 3.5 GHz band would be used for mobile WiMAX.¹⁷ NTIA admittedly did not consider technical operations that would "require the use of relatively low-power devices under specific technical and operational conditions to avoid causing harmful interference to other authorized users."¹⁸ The Commission's current plan is for small cell and fixed use, which do not present the complications of mobile devices traveling into and out of areas where radars may be operating. Third, when the Fast Track Report was issued in October 2010, the Commission did not have experience with geolocation databases as a spectrum management tool. Since that time, the Commission has finalized its TV white space rules, conditionally selected ten TV white space database administrators and certified two of them. The Commission also has activated the TV bands database for use.¹⁹

Similarly, WISPA believes that federal users can be thoroughly and completely protected through the use of commercial SAS databases. As discussed below, the Department of Defense (or another appropriate federal agency) could maintain its own database that could, in near real time, notify the commercial SAS databases that radar will be active at a given time in a given

¹⁶ See NPRM ¶ 67; see also Calabrese, Michael A., *Use It or Share It: Unlocking the Vast Wasteland of Fallow Spectrum* (Sept. 25, 2011), at 27, available at <http://ssrn.com/abstract=1992421> (noting the preclusive effect of large coastal exclusion zones).

¹⁷ See WISPA Task Force Comments at 4-5.

¹⁸ Fast Track Report at 4-1.

¹⁹ Public Notice, *Office of Engineering and Technology Authorizes TV White Space Database Administrators to Provide Service to Unlicensed Devices Operating on Unused TV Spectrum in the East Coast Region*, ET Docket No. 04-186, DA 12-1956 (rel. Dec. 6, 2012). The Office of Engineering and Technology stated that "[w]e anticipate authorizing nationwide operations of TV white space devices by mid-January 2013." *Id.* at 1.

location. The federal database could have provision for both manual and automatic input. The SAS would then automatically deem spectrum unavailable for the period of time – seconds, minutes or hours – that radar was in use.

This plan would be much more spectrally efficient than establishing permanent exclusion zones around ground-based and airborne areas and coastal regions. A substantially greater part of the country would be available for commercial uses without compromising the ability of military radar systems to operate fully and effectively.

For grandfathered fixed satellite earth stations,²⁰ WISPA agrees with the Commission that it would be appropriate to establish permanent geographic protection zones to “ensure that operation of grandfathered earth stations is not disrupted by new users in the 3.5 GHz Band.”²¹ Unlike radar systems that operate intermittently, earth stations must have the ability to operate at all times without interference. The size of the protection zones would depend on the type of commercial use in the 3600-3650 MHz band – small cells may be able to operate closer to a grandfathered earth station than higher power transmitters.²² WISPA agrees with the Commission that the location of the protection zones should be incorporated into the SAS. In addition, as Commission rules currently permit in the 3650-3700 MHz band, commercial users should have the right to negotiate with earth stations to operate within the protection zone, with negotiations to “be conducted in good faith by all parties.”²³

²⁰ These are shown on the diagram as black circles with diagonal lines.

²¹ *NPRM* ¶ 124; *see also id.* n.180 (noting that, in Higher Power Operation Zones, “higher powered operations would be geographically distant enough from Incumbent Access users so as to minimize the possibility of harmful interference to Incumbent Access operations”).

²² *See generally id.*, Part III.C.2.

²³ Section 90.1331(a)(3).

Priority Access Tier

The Commission proposes to set aside half of the 3.5 GHz Band – 50 megahertz – for Priority Access, and asks for comment on the frequency range for small cells.²⁴ WISPA agrees it would be appropriate to separate Priority Access spectrum from other portions of the band, and as shown in the diagram above, recommends that the 3550-3600 MHz segment be designated for Priority Access. This would accomplish several important objectives. First, although this lower 50 megahertz would be available for GAA, the SAS would be more likely to direct GAA users to the middle 50 megahertz to protect any existing Priority Access users.. Second, it would be easier and more spectrally efficient for both small cells and higher power operations if the Commission were to segregate these Priority Access operations. Third, segregating small cell users would result in less displacement of opportunistic GAA users.²⁵

WISPA also recommends that the Commission establish two other categories of Priority Access. *First*, in contrast to the Commission’s suggestion that current 3650-3700 MHz licensees be reclassified as GAA users,²⁶ WISPA recommends that existing locations registered in the ULS be grandfathered and accorded Priority Access status.²⁷ Although spectrally separated from the small cell Priority Access band proposed for the 3550-3600 MHz segment, existing 3650-3700 MHz Service registrants should not face the prospect of harmful interference from subsequent GAA users after the effective date of the rules adopted in this proceeding. This interference could easily arise if a new GAA location was established in the SAS database before the existing ULS database is transitioned to the SAS.

²⁴ See *NPRM* ¶¶ 72, 144.

²⁵ Small cells are shown on the diagram as solid red circles in the 3550-3600 MHz segment.

²⁶ See *NPRM*. ¶ 78.

²⁷ These are shown on the diagram as blue circles with diagonal lines.

Second, WISPA agrees with the Commission’s proposal to allow existing 3650-3700 MHz licensees “to operate within Higher Power Operation Zones at maximum power levels that mirror the current maximum power levels in the 3650-3700 MHz Band, subject to control by the SAS.”²⁸ Higher Power Operation Zones “would be a subset of Priority Access Zones, which would correspond to the geographic areas where WISPs could operate at higher power levels without causing interference to Incumbent Access users.”²⁹ The Commission also suggests that higher power operations be permitted in the 3.5 GHz Band in “inland rural areas.”³⁰ WISPA strongly supports both of these proposals and recommends that Higher Power Operation Zones be established for both the 3.5 GHz band as well as the 3650-3700 MHz band at the Priority Access tier.³¹ A Priority Access user would have co-equal rights with other Priority Access users. As discussed below, however, higher power operations should not be confined to inland areas.

As the Commission correctly observed in adopting rules for the 3650-3700 MHz band, “much of the interest in development of the band is focused on smaller markets and less densely populated areas of the US where there is less likelihood of congestion and interference.”³² WISPs are using the 3650-3700 MHz band to deliver broadband services to rural areas of the country, where the need for broadband is greatest. According to the Commission, there are

²⁸ *NPRM* ¶ 79.

²⁹ *Id.* n.178.

³⁰ *Id.* ¶ 57, Figure 1.

³¹ High Power Operation Zones are depicted on the diagram as purple diagonal lines in each of the 3600-3650 MHz and 3650-3700 MHz bands.

³² *Wireless Operations in the 3650-3700 MHz Band*, Report and Order and Memorandum Opinion and Order, 20 FCC Rcd 6502, 6513 (2005).

approximately 19 million Americans that do not have access to fixed broadband services.³³ The Commission stated in the *Eighth Broadband Report* that:

Approximately 14.5 million of the 19 million (or 76 percent) Americans without access to fixed broadband meeting the speed benchmark reside in rural areas. In comparison, 4.5 million of the 19 million (or 24 percent) of Americans living in non-rural areas are without access to these services. The percentage of Americans without access in rural areas is 23.7 percent as compared to 1.8 percent in non-rural areas. These figures indicate that nearly one in four rural Americans lack access to fixed broadband meeting our speed benchmark. These data reflect that rural Americans are more than thirteen times more likely to lack access to fixed broadband than Americans in non-rural areas.³⁴

In recently adopting rules for its Rural Broadband Access Loan and Loan Guarantee Program, the Rural Utilities Service agreed with this assessment, stating that:

Analysis suggests that rural economies benefit generally from broadband availability. In comparing counties that had broadband access relatively early (by 2000) with similarly situated counties that had little or no broadband access as of 2000, employment growth was higher and nonfarm private earnings greater in counties with a longer history of broadband availability. By 2007, most households (82 percent) with in-home Internet access had a broadband connection. A marked difference exists, however, between urban and rural broadband use – only 70 percent of rural households with in-home Internet access had a broadband connection in 2007, compared with 84 percent of urban households. The rural-urban difference in in-home broadband adoption among households with similar income levels reflects the more limited availability and affordability of broadband in rural settings.³⁵

With access to additional non-exclusive spectrum, WISPs would be extremely well positioned to expand their coverage areas and to initiate service to those consumers and businesses that currently lack access to fixed broadband service.

³³ See *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, Eighth Broadband Progress Report, 27 FCC Rcd 10342, 10370 (2012) (“*Eighth Broadband Report*”); *In the Matter of Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, WC Docket No. 10-90, *et al.* (rel. Nov. 18, 2011), ¶ 4 n.3.

³⁴ *Eighth Broadband Report* at 10370 (footnotes omitted).

³⁵ Rural Broadband Access Loans and Loan Guarantees, RIN 0572–AC06, 78 Fed. Reg. 8353, 8353 (Feb. 6, 2013).

To help achieve this objective, WISPA recommends that the Commission establish Higher Power Operation Zones in “rural areas.” Consistent with the broad policy goal of making broadband available to all Americans in a reasonable and timely manner,³⁶ and in light of the documented disparity in fixed broadband needs between urban and rural areas, the Commission should adopt an expansive definition of “rural area” where WISPs and others can operate at higher power levels. WISPA proposes that the Commission utilize the definition on which the Rural Utilities Service relies for its Community Connect grant program:

[A]ny area, as confirmed by the latest decennial census of the Bureau of the Census, which is *not located within*: (i) A city, town, or incorporated area that has a population of greater than 20,000 inhabitants; or (ii) An urbanized area contiguous and adjacent to a city or town that has a population of greater than 50,000 inhabitants. For purposes of the definition of rural area, an urbanized area means a densely populated territory as defined in the latest decennial census of the U.S. Census Bureau.³⁷

Because the Higher Power Operation Zones would include only the 3600-3650 MHz and 3650-3700 MHz bands, it would not be necessary to limit Priority Access areas to “inland” rural areas. Any such limitation would be designed to protect military radar operations, which exist only in the lower 3550-3600 MHz segment. By restricting the Higher Power Operation Zones to the 100 megahertz from 3600-3700 MHz, the need to impose geographic restrictions disappears. Priority Access would however be limited by the presence of grandfathered earth stations that have Incumbent Access rights in certain geographic areas in both the 3600-3650 MHz and 3650-3700 MHz bands, as determined by the SAS.

General Authorized Access Tier

WISPA agrees that the GAA tier should be limited to opportunistic use that relies on the SAS to determine the presence of Incumbent Access and Priority Access users to determine

³⁶ Act § 706.

³⁷ Community Connect Broadband Grant Program, 77 Fed. Reg. 68705, 68707 (Nov. 16, 2012) (emphasis added).

spectrum availability at a given location at a given time. The GAA would include the entire 150 megahertz of spectrum between 3550-3700 MHz, subject to the Incumbent Access and Priority Access tiers described above. As one example, GAA would include small cells that do not qualify for “critical use” (*i.e.*, not Priority Access). As the Commission proposes, GAA devices would be required to register in the SAS.³⁸

Technical and operating rules for GAA would be the same as for the Priority Access tier. Thus, WISPA envisions two distinct equipment markets emerging. First, equipment for small cells would develop for “critical uses”³⁹ with Priority Access rights or other indoor and short-range GAA uses. Second, equipment for larger cells operating at a maximum power equivalent to the power adopted for Higher Power Operation Zones would be developed and could also be used for GAA in areas that do not qualify for Priority Access.

The Spectrum Access System

WISPA supports the Commission’s proposal “to create a SAS to govern interactions between and among devices in the 3.5 GHz band that is modeled on the TVWS database concept.”⁴⁰ WISPA agrees that “database technology be used to prevent interference between small cell users and the incumbents and to manage access between tiers of authorized commercial users in the band, while protecting the integrity of critical federal information.”⁴¹

In implementing the SAS, the database must first include the protection zones to protect the Incumbent Access rights of fixed federal users and satellite earth stations. The TV white space database already does this in the TV bands, and it would appear to be even easier to incorporate these protection zones here because the incumbents are static and are less likely to

³⁸ See *NPRM* ¶ 75. The GAA tier is shown on the diagram as green diagonal lines.

³⁹ See Section II, *infra*.

⁴⁰ *NPRM* ¶ 95.

⁴¹ *Id.*

change than TV stations and other TV band incumbents. The second aspect is the ability of the SAS technology to interface with the government databases to enable real-time notification of intermittent military radar use. The Commission adopted rules for the 70/80/90 GHz service under which an automated mechanism transmits a “green light” or “yellow light” to designate channel availability in a given area.⁴² Although the 70/80/90 GHz federal database includes permanent links, WISPA is confident that this capability can be incorporated into the SAS process for intermittent radar without compromising national security. Next, the Priority Access layer can be constructed with the existing 3650-3700 MHz registrants. Over time, Priority Access would be determined for small cells and for Higher Power Operation Zone use in real time. Technical parameters would include those elements required for fixed TV white space devices as specified in Section 15.713(f), but would add the following items: maximum EIRP (small cell or Higher Power Operation Zone equipment), azimuth, beamwidth, polarization, ground elevation, antenna height and modulation scheme.⁴³ Finally, the algorithm for GAA use would account for opportunistic use when and where users in the other tiers are not present in the SAS. The data inputs for the GAA tier would be the same as those for the Priority Access tier. Other than grandfathered 3650-3700 MHz registrations that have not transitioned to the SAS, all devices would be required to incorporate geolocation technology.⁴⁴

WISPA recommends that the Commission authorize multiple commercial entities to administer the SAS database.⁴⁵ The Commission adopted a similar process for the TV bands database, and the conditional selection of ten separate administrators demonstrates that

⁴² *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands*, Report and Order, 18 FCC Rcd 23318, 23341-42 (2003), ¶ 54. See also PCAST Report at 75 (noting that NTIA and the Department of Defense are developing a new, automated Federal Spectrum Management System).

⁴³ These additional items are required for registration of fixed locations for the 3650-3700 MHz band.

⁴⁴ See *NPRM* ¶ 104; see also Section IV, *infra*.

⁴⁵ See *id.* ¶ 99.

competition should evolve, creating value-added database services that will benefit users and the public.⁴⁶ The Commission found that “it is in the public interest to have multiple parties developing business models for this new mechanism. The value of this exercise extends beyond databases for the TV bands, as the Commission is also considering employing similar database approaches in other spectrum bands.”⁴⁷ The 3.5 GHz Band would appear to be a perfect band to designate multiple database providers.

II. SMALL CELLS SHOULD BE RESTRICTED TO INDOOR AND SHORT-RANGE USE.

The Commission proposes the use of “small cells” for “mission critical” use on a Priority Access basis.⁴⁸ WISPA does not object to this proposal but, as explained above, strongly urges the Commission to also authorize Priority Access for current, already-deployed 3650-3700 MHz Service licensees in Higher Power Operation Zones. WISPA believes that “mission critical” uses will be using power levels low enough to be attenuated by building walls.

The Commission seeks comment on what should constitute critical use facilities and who should be considered a critical user.⁴⁹ As a starting point, WISPA suggests that the Commission use the definition of “critical infrastructure industry” contained in Section 90.7 of its rules:

State, local government and non-government entities, including utilities, railroads, metropolitan transit systems, pipelines, private ambulances, volunteer fire departments, and not-for-profit organizations that offer emergency road services, providing private internal radio services provided these private internal radio services are used to protect safety of life, health, or property; and are not made commercially available to the public.

⁴⁶ See *White Space Database Order*.

⁴⁷ *Id.* at 556.

⁴⁸ See *NPRM* ¶ 73.

⁴⁹ See *id.*

This definition should be expanded to include emergency shelters, power plants and schools. In addition, communications should not be limited to private non-commercial services, but rather should include commercial services such as public WiFi in hospital waiting areas

In addition, the Commission's rules should consider the *use* of the small cell, not necessarily the *user*. This would allow a WISP, system integrator or other private party to be "licensed by rule" to provide the critical services at and on behalf of the "mission critical" end user. These entities may be better able to deal with the Commission's regulatory requirements than a facility that does not typically interact with the Commission.

Small cell use should be restricted to indoor use except where the proposed use necessarily requires short-range outdoor use. Examples could include small cells deployed at outdoor electric grids or along pipelines. Restricting small cell use to indoor and short-range applications will allow more opportunistic GAA use, and will help ensure that Priority Access is not used for unauthorized purposes.

The Commission tentatively concludes that it should limit small cells to a maximum EIRP of 1 Watt (30 dBm).⁵⁰ WISPA agrees and also suggests that setting a maximum EIRP is sufficient without setting a requirement for maximum transmitter output power or maximum antenna gain. This will afford users greater flexibility.

III. THE COMMISSION SHOULD HARMONIZE THE RULES FOR THE 3650-3700 MHz SERVICE WITH THE RULES IT ADOPTS FOR THE CITIZENS BROADBAND SERVICE.

The Commission observes that "[e]xpanding the applicability of our proposed licensing model for the Citizens Broadband Service in this way could have significant benefits for current 3650-3700 MHz operators, new entrants, and the general public."⁵¹ The Commission recites

⁵⁰ *See id.* ¶ 131.

⁵¹ *Id.* ¶ 80.

many potential benefits, but also notes that including the existing service in the Citizens Broadband Service “could subject current licensees to transition costs and a potentially more complicated regulatory regime.”⁵²

WISPA urges the Commission to include the 3650-3700 MHz band in the rules it adopts for the Citizens Broadband Service, and to adopt common technical rules. In addition, WISPA proposes processes that will ease the transition for existing users of the 3650-3700 MHz band and for the migration of the existing ULS registration system into the SAS.

Many WISPs rely on the 3650-3700 MHz band to provide fixed wireless broadband services. The ability of WISPs to have access to 150 megahertz of contiguous spectrum is a key public interest benefit in this proceeding.⁵³ This benefit can be maximized if the entire 150 megahertz is subject to the same operational and technical rules. WISPs can better plan expansion of their networks by adding adjacent spectrum over time using the same equipment. Equipment costs should be lower because manufacturers will need to design only one set of higher power equipment for the entire 150 megahertz band. This will drive innovation from manufacturers and facilitate greater use of the spectrum given that there will a significant lowering of equipment costs. Further, operators can operate using wider channels to provide greater throughput and to serve more subscribers. In short, WISPA can think of no reason why the Commission should not combine the 3.5 GHz Band and the 3650-3700 MHz band into a common band governed by a single set of rules.

The Commission also should eliminate the rule requiring equipment in the lower 25 megahertz in the 3650-3700 MHz band to operate with “restricted” protocols.⁵⁴ The Commission adopted this rule to be “an effective mechanism to facilitate multiple users in the

⁵² *Id.*

⁵³ *See id.* ¶ 82.

⁵⁴ *See* Sections 90.1319(b) and (c).

[3650-3700 MHz] band,” a rationale that would appear to be obsolete if the Commission makes available an additional 100 megahertz of contiguous spectrum pursuant to the SAS database.⁵⁵ The Commission’s goal of speeding service to the public would be hindered, not assisted, by retaining this restriction.

In addition, the Commission has the opportunity to consider changes to other 3650-3700 MHz Service rules. These include increasing power limits⁵⁶ and eliminating the requirement that fixed end user locations be registered.⁵⁷ WISPA appreciates that the Satellite Industry Association (“SIA”) has opposed these recommendations in the past,⁵⁸ and believes that the SAS can provide an enhanced layer of protection that will alleviate those concerns.

IV. THE COMMISSION SHOULD TRANSITION THE 3650-3700 MHz SERVICE TO THE SPECTRUM ACCESS SYSTEM ADOPTED FOR THE ADJACENT 3550-3650 MHz BAND OVER A REASONABLE PERIOD OF TIME.

The Commission anticipates affording existing 3650-3700 MHz licensees a “reasonable period of time to transition” from the current “light licensing” registrations regime to the SAS,⁵⁹ and seeks comment on how long the transition should take. WISPA members have informally indicated a strong desire to avoid having to immediately change out or upgrade equipment or to transition to the geolocation database. Moreover, it may take some time for manufacturers to develop and certify equipment that can be used in conjunction with the SAS to ensure that it complies with the three-tiered database structure the Commission envisions.

WISPA appreciates the benefits and security that the SAS will provide over the ULS registration process that currently exists. With all equipment working in conjunction with the

⁵⁵ *Wireless Operations in the 3650-3700 MHz Band*, Memorandum Opinion and Order, 22 FCC Rcd 10421, 10431 (2007).

⁵⁶ See Section 90.1321(a).

⁵⁷ See Section 90.1307.

⁵⁸ See Reply Comments of the Satellite Industry Association, GN Docket No. 09-47, *et al.* (Nov. 13, 2009).

⁵⁹ *Id.* ¶ 81.

database, there will be fewer instances of unregistered “pirate” stations causing interference to existing operators that properly register fixed locations. In addition, there would be fewer “phantom” stations that register and then do not go on the air. Under a “license by rule” regime, all locations and technical parameters would be entered into the database so that Priority Access can be protected and opportunistic GAA use can be coordinated. Commission staff would be freed from the administrative burden of reviewing each registration and then seeking amendment of registrations to correct or complete incorrect or missing information on the registration form. In short, the manual registration process in ULS has served its purpose, but the more efficient and accurate SAS represents an evolutionary development that renders ULS registration obsolete.

WISPA proposes a transition period of five years following the effective date of SAS activation. Five years should be a sufficient period of time for existing equipment inventory to be depleted and for manufacturers to develop and certify new, database-capable equipment. After that date, any new equipment used in the 3650-3700 MHz band – whether for a new location or replacement equipment – would need to be registered in the SAS database. Of course, if a registrant wanted to take advantage of the SAS before the end of the transitional period, it would be permitted to install equipment certified for the database. Early in the five-year transitional period, the Commission should begin to transition the legacy 3650-3700 MHz registrations into the commercial SAS database so that the benefits of the database can be expeditiously realized.

Conclusion

Through use of an SAS database regime, the Commission can structure an efficient spectrum sharing regime in the 3.5 GHz Band to stimulate a variety of fixed wireless services, both large and small, and in urban and rural areas. WISPA's proposals rely on the PCAST model as a starting point and present several enhancements that will be spectrally efficient, drive innovation and expand broadband access, while protecting the legitimate interests of federal and commercial incumbents. WISPA respectfully requests adoption of the proposals described above.

Respectfully submitted,

WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION

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